

CLAIMS

1. A safety knock-type writing instrument, comprising:

a barrel (10) having a cartridge (50) therein;

5 a gear unit (30) provided on an exterior of the barrel (10) and rotatably seated in a clip (20); and

a knock unit (60) positioned in the barrel (10), and including first and second protrusions (61, 62) to engage with the gear unit (30),

10 wherein the cartridge (50) is retracted into the barrel when the first protrusion (61) of the knock unit (60) disengages from the gear unit (30).

2. The safety knock-type writing instrument according to claim 1, wherein the clip (20) comprises:

15 a gear seat (40) to rotatably seat the gear unit (30) therein.

3. The safety knock-type writing instrument according to claim 1, wherein the gear unit (30) comprises:

20 a guide groove (32) to axially guide the first protrusion (61), the guide groove having predetermined depth and length to disengage from the first protrusion (61) when the gear unit (30) rotates;

a rotation guide part (33) to be spirally guided by the first protrusion (61);

25 a first protrusion seat (34) to seat the first protrusion (61) therein; and

a second protrusion seat (35) to seat the second

protrusion (62) thereon and to be spirally guided by the second protrusion (62).

4. A safety knock-type writing instrument, comprising:

a barrel (10) having a cartridge (50) therein;

5 a half gear unit (300) provided on an exterior of the barrel (10) and rotatably seated in a clip (20); and

a knock unit (60) positioned in the barrel (10), and including first and second protrusions (61, 62) to engage with the half gear unit (300);

10 wherein the cartridge (50) is retracted into the barrel when the first protrusion (61) of the knock unit (60) disengages from the half gear unit (300); and

the half gear unit (300) rotates in a rotating direction (R) and an opposite rotational direction (Q), in response to reciprocating motion of the knock unit (60) in a pushing direction (F) and a releasing direction (R).

5. The safety knock-type writing instrument according to claim 4, wherein the barrel (10) is formed so that a barrel body (10a) is integrated with a tip holder (12) into a single
20 structure, and comprises linear guide slits (16, 17) having a wide opening and a narrow opening, respectively, the linear guide slits having a predetermined length and being opened at a predetermined end so that the first and second protrusions (61, 62) axially slide along the linear guide slits while being
25 projected out of the linear guide slits.

6. The safety knock-type writing instrument according to

claim 4, wherein the barrel (10) is coupled to a ring-shaped part of the clip (20) by engagement of a first threaded part (18) of the barrel (10) with a second threaded part (28) of the clip (20).

5 7. The safety knock-type writing instrument according to claim 4, wherein the barrel (10) has a first tapered contact surface (19) at a position around the first threaded part (18), and the ring-shaped part of the clip (20) has a second tapered contact surface (29) to be in frictional contact with the first
10 tapered contact surface (19), the first and second tapered contact surfaces (19, 29) providing a relatively large contact area compared to a flat surface contact manner, thus increasing a coupling force when the first threaded part (18) of the barrel (10) having the guide slits (16, 17) engages with the second
15 threaded part (28) of the clip (20).

8. The safety knock-type writing instrument according to claim 4, wherein the half gear unit (300) has a shape of an eccentric gear which rotates about a central axis thereof, and comprises:

20 a first rotation guide part (310) providing a spirally inclined slide surface so that the first protrusion (61) of the knock unit (60) slides along the first rotation guide part to rotate the half gear unit within a predetermined angular range;

 a first inclined groove part (320) provided at a lower end
25 of an inclined surface of the first rotation guide part (310) to form a linearly inclined slide surface and a flat surface in a direction of an axis of rotating shafts (390a, 390b), the first

inclined groove part serving as a locking step using a height difference;

5 a first protrusion seat (330) provided at an end of the flat surface of the first inclined groove part (320) to have a height different from the first inclined groove part (320), the first protrusion seat having a spirally inclined slide surface and a sharp corner, thus seating and stopping the first protrusion (61) when the cartridge (50) is extended;

10 a second rotation guide part (340) provided above the sharp corner of the first protrusion seat (330), and having a toothed shape with a spirally inclined slide surface;

15 a second inclined groove part (350) which is the equal to the first inclined groove part (320), but has a linear inclined slide surface and a flat surface in an opposite direction to the first inclined groove part;

a third rotation guide part (360) having a slide surface so that the second protrusion (62) of the knock unit (60) slides along the third rotation guide part (360);

20 a second protrusion seat (370) to function as a stopper of the second protrusion (62); and

25 first and second sidewalls (380a, 380b) provided outside the first and second inclined groove parts (320, 350) to be perpendicular to the first and second inclined groove parts, the first and second sidewalls guiding and restraining the rotation of the first protrusion within the predetermined angular range.